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09/966,604	09/27/2001	Victor M. Benveniste	ETE-025	4759

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LAHIVE & COCKFIELD  
28 STATE STREET  
BOSTON, MA 02109

EXAMINER
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HE, AMY

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 04/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/966,604

Applicant(s)

BENVENISTE, VICTOR M.

Examiner

Amy He

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2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 13, 15 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 12 February 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-2, 4, 8-12, 14 and 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Keller (U.S. Patent No: 6,504,159).

Referring to claim 1, Keller discloses a system for determining the presence or absence of an ion in a plasma, comprising:

an ion source (ECR source 210 in Figure 3) having a plasma chamber (245 in Figure 2) sized and dimensioned for generating a plasma having an ion present therein, and

a probe assembly (the combination of magnetic filter and plasma grid in Figures 3 and 5) coupled to the ion source for detecting said ion of said plasma.

Referring to claim 2, Keller discloses the system of claim 1, wherein said probe assembly comprises a probe device (plasma grid in Figure 3) extending within the plasma chamber for extracting said ion from said plasma (column 7, lines 59-60).

Referring to claim 4, Keller discloses the system of claim 1, wherein the probe assembly comprises:

a probe device(plasma grid in Figure 3) for extracting one or more of said ions from said plasma, and

a filter (the magnetic filter in Figure 5) coupled to said probe device for filtering said one or more ions extracted by said probe device from said plasma (column 10, claim 11).

Referring to claim 9, Keller disclose the system of claim 1, further comprising a vacuum source (270 in Figure 2) coupled to said probe device for creating a selected pressure condition therein for facilitating extraction of said ion from said plasma chamber.

Referring to claim 10, Keller discloses the system of claim 1, wherein said probe assembly comprises a probe device (plasma grid in Figure 3) having a probe body, a portion of which is adapted to extend into said plasma chamber (plasma chamber 245 in Figure 2), and a set of electrodes (magnetic filter in Figure 5) coupled to said probe body for creating a field (magnetic field) therein.

Referring to claim 11, Keller discloses the system of 1, wherein said probe assembly comprises a probe device (plasma grid in Figure 3) for extracting one or more ions from said plasma, a filter (magnetic filter in Figure 5) for filtering said ions, and a controller (the combination of the plasma grid and the magnetic filter in Figures 3 and 5) for detecting said one or more ions.

Referring to claim 12, Keller discloses a probe assembly suitable for use with an ion source for detecting an ion in a plasma within a plasma chamber of the ion source, comprising:

a probe body (plasma grid inside the plasma chamber) adapted for extending at least partly within the plasma chamber of the ion source;

a focusing element (the plasma grid or the magnetic filter in Figures 3 and 5) coupled to said probe for generating a selected field (voltage field generated by the grid or magnetic field generated by the magnetic filter) within the probe; and

a filter (the magnetic filter in Figure 5) coupled to said probe for filtering said ion passing through said probe and extracted from said plasma chamber.

Referring to claim 14, Keller discloses the probe assembly of claim 12, wherein a set of electrodes (the plasma grid or the magnetic filter in Figures 3 and 5) is coupled to said probe body for creating a field (voltage field generated by the grid or magnetic field generated by the magnetic filter) therein.

Referring to claims 17-19, they are the method claims corresponding to the rejected system claims 1, 4 and 12. They are rejected for the same reasons as stated above for the rejection of claims 1, 4 and 12.

2. Claims 1, 4-5, 8-9, 11 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamaguchi et al. (U.S. Patent No: 5,113,072).

Referring to claim 1, Yamaguchi et al. discloses a system for determining the presence or absence of an ion in a plasma, comprising:

an ion source (a liquid metal ion source, column 7, lines 63-65; 1908 in Figure 19) having a plasma chamber(chamber 1201 in Figure 12) sized and dimensioned for generating a plasma having an ion present therein, and

a probe assembly (the combination of 1203, 1206-1208, 1901, 1214-1216 and 1221 in Figures 12 and 19) coupled to the ion source for detecting said ion of said plasma.

Referring to claims 4 and 5, Yamaguchi et al. discloses the system of claim 1, wherein the probe assembly comprises:

a probe device(1221 in Figure 19) for extracting one or more of said ions from said plasma, and

a filter (a Wien filter 1901 in Figure 19) coupled to said probe device for filtering said one or more ions extracted by said probe device from said plasma (column 10, lines 4-5).

Referring to claim 8, Yamaguchi et al. discloses the system of claim 4, further comprising means for generating an electric field (extraction electrode 1206 in Figure 12, column 8, line 2) within the filter to separate one or more ions based on ion velocity.

Referring to claim 9, Yamaguchi et al. disclose the system of claim 1, further comprising a vacuum source (a source for creating the vacuum chamber 1201 in Figures 12 and 19) coupled to said probe device for creating a selected pressure condition therein for facilitating extraction of said ion from said plasma chamber.

Referring to claim 11, Yamaguchi et al. discloses the system of 1, wherein said probe assembly comprises a probe device (1221 in Figure 12) for extracting one or more ions from said plasma, a filter (a Wien filter 1901 in Figure 19) for filtering said ions, and a controller (1221 in Figures 12 and 19) for detecting said one or more ions.

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Referring to claim 17, Yamaguchi et al. discloses a method for detecting an ion within a plasma generated within a chamber (1201 in Figure 12) of an ion source (1908 in Figure 19), comprising the steps of:

extracting the ion from the ion source with a probe device (column 7, line 68-column 8, line 5); and

detecting the ion extracted from the plasma chamber (column 8, lines 1-30; column 10, lines 1-8).

Referring to claim 18, Yamaguchi et al. discloses the method of claim 17, further comprising the step of, prior to the detecting step, filtering (by using a Wien filter, column 10, lines 1-8) one or more ions extracted from the ion source.

Referring to claim 19, Yamaguchi et al. disclose the method of claim 17, wherein the step of filter comprises the step varying a field (varying a magnetic field, column 10, lines 6-8) so as to filter the one or more ions based on ion velocity.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keller (U.S. Patent No: 6,504,159).

Referring to claim 3, Keller discloses the system of claim 2, wherein the probe device comprises a probe body device (plasma grid in Figure 3) disposed within the plasma chamber, and a focusing element (the magnetic filter in Figure 5) mounted to said probe body and adapted for generating a field (magnetic field) when energized. Keller does not specifically disclose that the probe body (the plasma grid in Figure 3) has a conical tip. Keller, however, suggests that any desired shape of the plasma grid can be used to accommodate the function of extracting ions. Therefore, a person of ordinary skill in the art at the time of the invention would find it obvious to modify Keller to use a probe with a conical tip, in order to limit the amount of ions extracted at one time.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (U.S. Patent No: 5,113,072) as applied to claim 17 above, and further in view of Rand et al. (U.S. Patent No: 6,208,711).

Referring to claim 20, Yamaguchi et al. discloses the method of claim 17. Yamaguchi et al. do not disclose the step of twisting a set of electrodes to produce a rotating quadrupole field that alternately focuses ions in all directions. Rand et al. disclose such a twisting step (column 5, lines 27-35). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the step of twisting the electrodes as taught by Rand et al. in order to produce a focused ion beam with zero net displacement.



5. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (U.S. Patent No: 5,113,072) as applied to claims 1 and 4 above, and further in view of Parker (U.S. Patent No: 4,789,787).

Referring to claims 6 and 7, Yamaguchi et al. disclose a Wien filter for filtering the ions extracted from the plasma. Yamaguchi et al do not specifically disclose a Wien filter comprises a plurality of steel strips biased at different voltages to produce one of a potential gradient and a uniform electric field. Parker discloses such a Wien filter (Figure 4b; column 6, lines 9-16). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Yamaguchi et al. to use a Wien filter, as taught by Parker, for the advantage of speeding up the transmission of charged particles through the filter.

#### ***Response to Arguments***

6. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Allowable Subject Matter***

7. Claims 13, 15 and 16 are objected to as being dependent upon a rejected base claim (claim 12), but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy He whose telephone number is (703) 305-3360.

The examiner can normally be reached on 8:30am-5pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

Supervisor, N. Le can be reached on (703) 308-0750.

The official Fax numbers for the organization are (703-872-9318) Before-Final and (703-872-9319) After-Final Office actions. Any inquiry of a general nature relating to this application should be directed to the receptionist at (703) 305-4900.

ah  
AH  
April 21, 2003



**N. Le**  
**Supervisory Patent Examiner**  
**Technology Center 2800**